

Ivy and Sumac Poisoning

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IVY AND SUMAC POISONING

Many persons first learn by painful experience that contact with certain plants can cause an inflammation of the skin. In picnicking or walking through fields and woods the plants may be accidentally touched or brushed against, but poisoning is frequently contracted by picking the attractive foliage or flowers, or even by exposure to smoke coming from burning shrubbery containing these poisonous plants.

While there are a great many plants which may irritate the skin of susceptible persons, most of the cases of plant dermatitis in the United States are caused by the plants commonly known as poison ivy and poison sumac.

It is impossible for the average person to learn to recognize all the plants which are known to be skin irritants, but many cases of plant poisonings could be prevented if the public would learn to recognize and avoid contact with poison ivy and poison sumac, and also learn the various means of preventing their toxic effects.

Poison Ivy¹

Poison ivy, also known in some parts of the country as poison oak, mercury, piery, climbing sumac, markweed, and poison vine, grows in the form of woody perennial vines, low erect bushes, or trailing shrubs. It flourishes in the woods or in the open, in dry or moist locations, and it is particularly abundant along fence rows, paths, and roadways, often climbing posts and trees to considerable heights. The various forms differ mainly in the shape and margins of the leaflets, the size of the fruit, and the habit of growth. They are so much alike in general character, however, that familiarity with any one form will make it possible to recognize the plants wherever they are found. The leaves are always divided into three leaflets, usually with notched and indented margins, and the whitish waxy fruits, which resemble mistletoe berries, contain a single stony seed. The leaflets vary from 1 to 4 inches in length, when mature are dark green on the upper surface and lighter and sometimes velvety underneath. In the spring the leaves are red when they first unfold, and in the fall they turn beautiful shades of scarlet and

¹ A fuller description of the various types of poison ivy and poison sumac is given in Farmers' Bulletin No. 1166 of the United States Department of Agriculture.

orange. Unsuspecting persons, attracted by their beauty, sometimes pick armfuls of the vines, and contract severe cases of poisoning.

Different forms of the plant are found in different parts of the country. In the eastern and central sections of the United States, poison ivy occurs as a vine, trailing shrub, or bush, with leaves similar to those shown in figure 2. A low, erect, small-fruited bush, sometimes called poison oak, is also found in many localities in the northern part of this region. From New Jersey, Delaware, and Virginia, south and southwest, a bushy, nonclimbing form occurs (fig. 3), which is sometimes called poison oak because of the resemblance of the leaves to certain types of oak foliage. West of this region, from Minnesota, Nebraska, and Arkansas, to Washington, Montana, Colorado, and New Mexico, western poison ivy or poison oak is found, a thicker leaved, low bush or trailing shrub. Throughout the Pacific coast region, the plant generally known as poison oak usually occurs as a bush 4 to 8 feet high, with leaflets resembling those of scrub oak (fig. 1). It is also found as a climbing vine and is sometimes called poison ivy or yeraa.

In the Eastern States, and westward as far as Wyoming and Texas, the Virginia creeper is found generally in the same localities as the poison ivy vine, and is sometimes confused with poison ivy. It is harmless to the touch and can be easily differentiated from poison ivy by the fact that it has 5 leaflets, while poison ivy always has three.

Poison Sumac

Poison sumac is a bush or tree with smooth grayish bark on the trunk and older branches, and reddish brown young branches. The leaves vary from 7 to 14 inches in length, and consist of a stalk bearing 7 to 13 leaflets arranged opposite one another in pairs, with a single, usually long-stalked leaflet at the end (fig. 4). The leaflets, which are of an elongated oval shape, from 3 to 4 inches long and $1\frac{1}{2}$ to 2 inches wide, are velvety and bright orange when they first unfold in the spring. In summer the leaves are dark green and glossy on the upper surface, with prominent scarlet midribs, and lighter green underneath; early in the autumn they turn to brilliant red, orange, and russet shades. Small, 5-petaled green flowers, in loose slender clusters about 3 to 8 inches long, appear early in summer, followed by shining ivory-white or yellowish fruit.

Poison sumac grows in moist ground, usually in swamps or along streams and ponds, and occurs from the New England States south to Florida, and westward to Minnesota, Arkansas, and Louisiana. It is known under various local names, such as poison dogwood, poison elder, poison ash, thunderwood, and poisonwood.

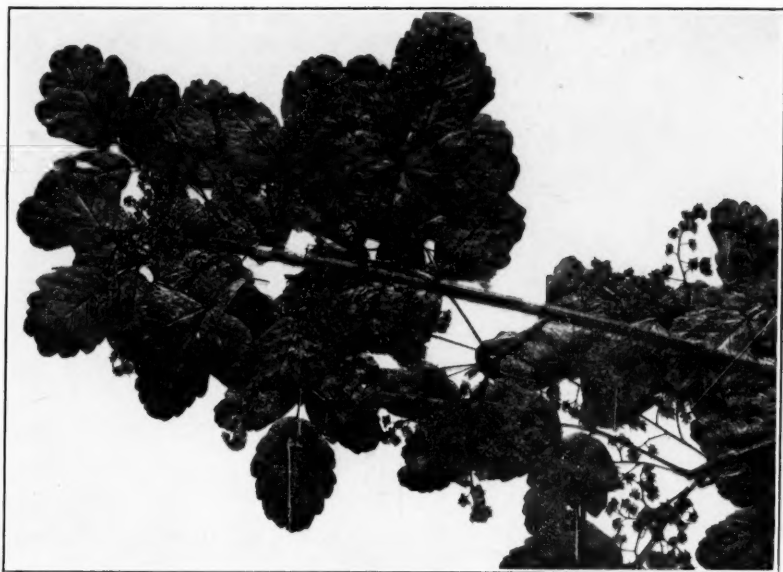


FIGURE 1.—Poison oak of California and the Pacific coast. (Reproduced by permission of the U. S. Department of Agriculture from Farmers' Bulletin 1166.)



FIGURE 2.—Poison ivy vine. (Reproduced by permission of the U. S. Department of Agriculture from Farmers' Bulletin 1166.)

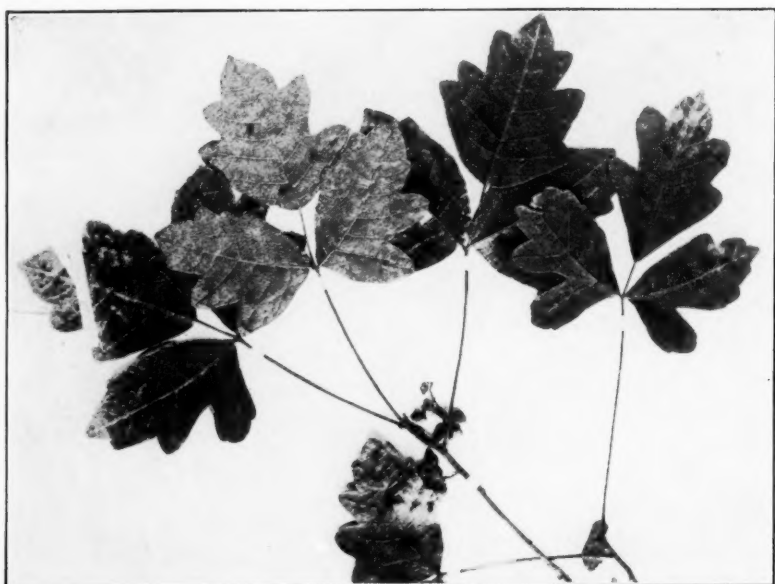


FIGURE 3.—Oakleaf poison ivy of eastern United States. (Reproduced by permission of the U. S. Department of Agriculture from Farmers' Bulletin 1166.)



FIGURE 4.—Poison sumac. (Reproduced by permission of the U. S. Department of Agriculture from Farmers' Bulletin 1166.)

Nature and Action of the Poison

Poison ivy and poison sumac are close relatives, and the skin irritation which they cause is due to the same toxic agent, an oily, non-volatile phenolic substance called urushiol, which they contain. All parts of the plant contain the poison, even after long drying, but growth in which the sap is abundant is the most dangerous. Hence, the leaves are most poisonous in the spring and summer and least poisonous in the late fall. The root also contains the poison and ivy poisoning can be contracted by digging up soil which contains poison ivy and poison sumac roots. Minute quantities of the poisonous substance are capable of producing severe inflammation of the skin in persons who are sensitive to it.

Poisoning is usually caused by touching or brushing against the plants, or by handling clothing, shoes, or other articles which have been in contact with the plants. Dogs and cats, after roaming through patches of poison ivy, may carry the poison on their fur, and susceptible persons may be poisoned by petting such animals. Smoke from the burning plants will carry the poison and may cause severe cases of poisoning.

Taken internally in sufficient dose, the plant is a violent irritant and poison. Cases of poisoning of children from eating the fruit have been reported. Cattle and sheep graze upon poison ivy foliage freely, apparently without any ill effects, at least from the relatively small amounts consumed under ordinary conditions.

Susceptibility

It has long been observed that certain persons have a marked degree of resistance to the action of the poisonous agents present in poison ivy and poison sumac and believe themselves to be immune. Such a person may have had repeated contact with the plant without symptoms, only to develop poisoning on a subsequent exposure. Experiments with such persons have shown that when they are subjected to prolonged exposure to the plants or to the toxic action of urushiol itself their skin does become inflamed to some degree and there is good reason for believing that absolute immunity to the toxic principle does not exist. Urushiol, the toxic principle, is not only a sensitizer but in sufficient concentration is a primary skin irritant. However, ivy poisoning is usually an allergic reaction since it has been shown that previous exposure is necessary in most cases for the development of susceptibility.

Symptoms

The symptoms of ivy poisoning are produced when the irritant poison penetrates the outer surface of the skin, and may appear

from a few hours to 5 days or even longer after exposure. An itching or burning sensation is first noticed, which becomes more intense as inflammation develops. There may be only reddening, accompanied by swelling, but more often small vesicles appear, which may show a tendency to run together and form blisters. The inflammation may continue to develop for several days, while the poison is being slowly absorbed. Pus may form in the vesicles, followed by the formation of a crust or scab as the eruption dries. After the inflammation subsides, the outer layers of the skin peel off, leaving a layer of new skin beneath. In mild cases this peeling may be so slight as to escape notice. Swelling of the parts involved nearly always occurs, and under ordinary conditions should not occasion undue alarm. It usually terminates as rapidly as it appears. In complicated cases, where infection is particularly severe, more serious symptoms may be present, such as abscesses, enlargement of glands, pain, fever, and other constitutional symptoms.

Prevention

The eradication of poison ivy and poison sumac is most important in the prevention of ivy and sumac poisoning. Communities should not permit poison ivy to grow along public roadways and in parks, and property owners should make every attempt to destroy such plants growing in much frequented locations on their premises. This destruction cannot always be brought about in a single season, for the plants are persistent in their growth, but with continued effort they can be eradicated from localized areas. It would be preferable to employ persons who are relatively insusceptible to poisoning for the eradication of poison ivy and poison sumac, but those who are susceptible can also undertake the work if they are protected by rubber gloves and heavy clothing, and are careful to remove after work all clothing coming in contact with the plants and have it washed before again putting it on. The skin should also be washed after such work, and precautions should be observed by those washing clothes contaminated with the poison. In burning dried, uprooted plants, care should be taken to keep away from the smoke.

Isolated clumps of poison ivy may be grubbed out, care being taken to remove the running rootstocks, which will produce another crop of plants if left in the ground. Various weed-killing chemicals are recommended by the Bureau of Plant Industry of the Department of Agriculture for the destruction of poison ivy.² Spraying with a saturated salt solution or oil is fairly effective, but recent tests have shown that better results can be obtained by using sodium

² Kephart, L. W.: Killing poison ivy with chemicals. U. S. Department of Agriculture mimeographed leaflet, May 20, 1939.

chlorate. Among valuable trees and shrubs it is best to spray with a weak solution (three-quarters pound per gallon of water), care being taken that the spray does not reach the leaves or tender bark of valued plants. The first spraying kills the leaves and younger twigs. As soon as a second crop of leaves appears they should be sprayed, and this operation should be repeated every time new leaves appear. In most cases the roots die after sending out three crops of leaves, but old large roots may produce four or more.

Sodium chlorate is not poisonous, but it carries a dangerous fire hazard. Clothing, wood, or any combustible material, when soaked with sodium chlorate, is capable of burning with explosive violence when dry. Extreme caution must be used not to allow the clothing to become wet with chlorate spray, or if it does become wet not to allow it to dry upon the person.

Either sodium arsenite or arsenic acid may be used as a spray for the destruction of poison ivy, but they are dangerous poisons and cannot be used where grazing animals will come in contact with the vegetation which has been sprayed. A solution of 4 to 6 ounces of dry sodium arsenite or 3 to 5 ounces of arsenic acid per gallon of water, used at the rate of 1 to 2 gallons per 1,000 square feet, is an average dose.

Kerosene may be sprayed on poison ivy foliage or poured around the roots, the latter being quite effective for large plants. Waste crankcase oil diluted with kerosene so that it sprays easily is more effective than ordinary kerosene and much cheaper to use.

Since poison sumac usually grows in swampy, inaccessible locations, the expense of eradication in such localities is not often warranted. However, it is sometimes found along paths or roadways where it may cause much injury. Here, eradication measures suggested for poison ivy should be employed.

Low, bushy growths of poison sumac may be grubbed out. The tops of the plants may be cut, and various chemicals, including common salt, kerosene, and crankcase oil, poured around the newly cut surfaces and the sprouts that appear later. The work of eradication can be undertaken during the fall or winter with the least risk, but it should be remembered that severe poisoning may be caused by either stems or roots at any stage if handled without the protection of gloves.

Persons who are susceptible to poison ivy should not only avoid touching the plants, but should use care in handling articles known or suspected to have been in contact with them. Toxic plants can usually be handled safely if rubber gloves are worn and care is used in removing the gloves. Clothing which has been in contact with the leaves may convey the infection for an indefinite period, and for this reason a change of garments following exposure is recommended,

particularly shoes which, perhaps, are a source of indirect contagion more often than any other article.

Immediately after exposure to poison ivy, the poison is on the surface of the skin and may be removed by thorough washing with soap and hot water and repeated rinsing. Ordinary kitchen or laundry soap is recommended, since it contains an excess of alkali. Washing with a mild alkali such as sodium carbonate or bicarbonate, borax or boric acid, photographer's "hypo" solution (sodium thio-sulfate), epsom salts, or even hydrated lime is also beneficial. The washing should be done as soon after exposure as possible and care should be used not to spread the poison to unexposed surfaces. Even if considerable time has elapsed since exposure, this method should be adopted in the hope that at least a portion of the poisonous material which has not had time to penetrate will be removed. When soap is used, an abundant lather should be produced, rinsed off completely, and the procedure repeated three or four times. Running water should be used, or the water in the basin should be changed frequently. The hands should receive particular attention, especially the fingernails and the tender skin between the fingers. Alcohol dissolves the poison, and the exposed parts may be cleansed with alcohol diluted in an equal amount of water. Care should be taken to remove the alcohol completely so that the poison will not be spread to other areas. If washing is done carefully and thoroughly, much if not all of the toxic material will usually be removed, and the inflammatory reaction will be prevented or greatly lessened.

Prophylactic inoculations of poison ivy extract have been shown to have a favorable effect upon the severity and incidence of ivy poisoning. This material should be administered by a physician, and injections should be repeated every year to obtain good results. In some localities it is thought that eating poison ivy leaves in the spring will confer immunity during the year; but this seems at best a dangerous experiment, and severe cases of poisoning contracted in this manner have been reported.

The United States Public Health Service has developed a protective ointment containing sodium perborate to be used as an effective preventive against poison ivy dermatitis. Two formulas were used in making the protective ointment. Both of the ointment bases used were found to be satisfactory from the standpoint of physical properties and in each of them the sodium perborate was more stable than in the vanishing cream originally used as a base. One of these ointments is less greasy than the other and, therefore, more pleasant to use. The greasier formula has the advantage of being more stable in extreme summer heat while the less greasy one must be stored in a cool place until used. Both are equally effective as protectives

against poison ivy. In preparing ointments containing sodium perborate, special care must be exercised in adding sodium perborate, as it is so rapidly broken down by heat. Water must be eliminated from the ointment base because it, too, causes the perborate to break down.

Treatment

Mild cases of ivy poisoning usually subside within a few days, but if the inflammation is severe or extensive, treatment should be administered by a physician. Thorough washing with soap and water should be tried even when the first signs of inflammation have appeared in order that all traces of the poison remaining on the surface of the skin may be removed.

The United States Public Health Service recommends as the most effective remedy for poison ivy a 10-percent solution of tannic acid dissolved in alcohol. The solution should be rubbed on vigorously so as to rub off the tops of the blisters. Large blisters should be opened with a sterilized instrument. The treatment should be repeated at 6-hour intervals, three or four times. The solution does not spread, nor is it absorbed by the skin. It stays fixed; the itching is relieved, scabs form, and the healing process begins.

Each of the following remedial measures has its advocate and has been found helpful in certain cases.

1. A 1 to 2,000 solution of potassium permanganate applied to the inflamed skin may neutralize whatever of the urushiol may be remaining on the surface. The tops of blisters should be clipped off with sterile scissors and the solution may be applied. After a few minutes the permanganate solution should be washed off the skin. The brown stain caused by the solution will wear off or it can be removed by the application of lemon juice, or better still by washing the skin in a 2-percent solution of sodium hydrosulfite and washing this off with water.

2. A 10-percent solution of sodium thiosulfate (photographer's "hypo" solution) applied as a wet dressing may give relief in many instances.

3. Local applications of a solution of baking soda or of Epsom salts may also help to allay the irritation.

4. The application of calamine lotion is useful in the early stages, and the addition of 2-percent phenol to the lotion tends to allay the itching. The immersion of the inflamed surface in hot water for several minutes, the temperature of the water gradually being raised until it is as hot as can be borne, also tends to relieve the itching.

5. It is better to leave the inflamed areas exposed to the air rather than to cover them with dry dressings. In severe cases showing much swelling and weeping, it is best to use compresses or wet dress-

ings of a saturated solution of boric acid or a 5-percent solution of aluminum acetate (Burow's solution) until the swelling subsides and the discharge ceases. Dressings should be changed frequently, especially if pus has formed or the secretion is excessive.

Ointments should not be used in acute stages, because compounds with a fatty base tend to spread whatever poison may be remaining on the skin and thus extend the area of inflammation.

In the later stages of the disease the application of a mild boric acid or zinc ointment tends to hasten healing.

Poison ivy extract in minute ascending doses, given hypodermically, is now a recognized prophylactic agent. It should always be administered by a physician because complications may arise from its use by unskilled hands.

It should be emphasized that self-treatment of ivy poisoning, as well as of any other disease or condition, is not to be recommended. The symptoms of ivy poisoning may be confused with those of other conditions by persons unskilled in medical knowledge and much harm may be done by improper treatment. In all cases the safest procedure is to consult a competent physician.

